

**To:** Kraemer, Stephen[Kraemer.Stephen@epa.gov]  
**From:** Sullivan, Kate  
**Sent:** Mon 8/17/2015 4:09:05 PM  
**Subject:** RE: FYI Region 8 Data for Animas spill

Steve

Please stop downloading data. Please alert the data downloading center (Lourdes) so we can do this in an organized fashion.

Thanks.

Kate

**From:** Kraemer, Stephen  
**Sent:** Monday, August 17, 2015 10:58 AM  
**To:** Washington, John; Sullivan, Kate  
**Cc:** Knightes, Chris  
**Subject:** RE: FYI Region 8 Data for Animas spill

The USGS Upper Animas River study might be useful.

**From:** Washington, John  
**Sent:** Monday, August 17, 2015 8:19 AM  
**To:** Kraemer, Stephen; Sullivan, Kate  
**Cc:** Knightes, Chris  
**Subject:** RE: FYI Region 8 Data for Animas spill

Thanks Steve,

Unless I am missing something, this highlights a problem in having the proper data for fate and transport modeling. One of the most important measures (arguably most important) of impact and persistence from acid mine drainage is acidity, effectively the buffering capacity of the drainage to maintain a low pH when alkalinity is added. Acidity commonly is expressed in mg/L as  $\text{CaCO}_3$  and is a function dominantly of dissolved  $\text{Fe}^{3+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Al}^{3+}$ ,  $\text{Mn}^{2+}$  and pH.

Dissolved  $\text{Fe}^{3+}$ ,  $\text{Fe}^{2+}$  and  $\text{Mn}^{2+}$  are glaring omissions, as is the chemistry of the minepool. If there are no background data, this also is a problem. I think this area has ancient metasediments including carbonates as well as igneous. Judging from names I see in the area of the spill (Cement Creek and Soda Mountain (or Soda something)), the background creek chemistry might differ from the background Animus River, so backgrounds at each confluence might help as well.

In the dataset, I saw some pHs, only a few  $\text{Al}^{3+}$ , some Fe without valence specified, and no  $\text{Mn}^{2+}$ . Without some knowledge of these parameters, it is impossible to predict fate with the precision probably desired so far as I know.

John

PS: If someone wants to understand the data that is available, the spreadsheet that is on-line needs to be reformatted and this would take a lot of time. As a first guess, each sample location on its own worksheet (ordered upstream to downstream), analytes across the spreadsheet (dissolved first, total last), dates listed down the spreadsheet chronologically). UNLESS: there are only a few dates, then swap the above analytes listed down and dates listed across.

**From:** Kraemer, Stephen  
**Sent:** Friday, August 14, 2015 5:00 PM  
**To:** Sullivan, Kate

**Cc:** Washington, John; Knightes, Chris

**Subject:** FYI Region 8 Data for Animas spill

<http://www2.epa.gov/goldkingmine/gold-king-mine-data-august-12-2015>